

3. A photonic switch as claimed in claim 2, wherein said switch fabric comprises an input matrix with  $K$  rows and  $I$  columns of input optical switching elements, and an output matrix with  $K'$  rows and  $I'$  columns of output optical switching elements;

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wherein each input port is associated with a column of said input matrix and each wavelength arriving on said input port is associated with a row of said input matrix, and

wherein each said output port is associated with a column of said output matrix and each wavelength transmitted at said output port is associated with a row of said output matrix.

4. A photonic switch as claimed in claim 3, wherein said switching elements have minimum four degrees of freedom of orientation.

5. A photonic switch as claimed in claim 3, wherein said switching elements are 3-D MEMS mirrors.

6. A photonic switch as claimed in claim 3, wherein said optical demultiplexer and said input ports are arranged in a predetermined position relative to each other along said predetermined input path, for separating each input multichannel signal into component wavelengths according an area of incidence of said input multichannel signal on said demultiplexer.

7. A photonic switch as claimed in claim 6, wherein said demultiplexer and said input matrix are arranged in a predetermined position relative to each other along said predetermined input path, for directing each said component wavelength from said demultiplexer to said input matrix according to said wavelength  $\lambda_k$  and said input port  $i$ .

8. A photonic switch as claimed in claim 1, further comprising optical elements arranged along said first predetermined input path for directing said wavelength from said input port  $i$  on said assigned ingress area.

30 a control unit for configuring said switch fabric to direct said wavelength along an adaptable path between said assigned ingress area and said associated egress area, and configuring said switch fabric to

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30 18. A photonic switch as claimed in claim 1, further comprising a plurality of drop ports.

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19. A photonic switch as claimed in claim 18, wherein said switch fabric comprises an output matrix with  $K'$  rows and  $I'$  columns of output optical switching elements and a drop zone of  $M'$  rows and  $N'$  columns of output optical switching elements,

5 wherein each said output port is associated with a column of said switching zone and each said wavelength is associated with a row of said switching zone, and

wherein each drop port is associated with a column of said drop zone and each wavelength arriving on said drop port is associated with a  
10 row of said drop zone.

20. A method of routing a wavelength within a photonic switch of a DWDM network, comprising:

pre-establishing an input optical path between an input port  
15 associated with said wavelength and an assigned optical switching element of an input matrix, according to a connectivity map;

establishing an adaptable path from said assigned optical switching element to an associated optical switching element of an output matrix;  
and

20 pre-establishing an output optical path between said associated optical switching element and an output port of interest according to said connectivity map.

21. A method as claimed in claim 20, further comprising transiting  
25 said adaptable route to connect said assigned optical switching element to another optical switching element of said output matrix, whenever said connectivity map changes.

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22. A photonic switch for routing a plurality of wavelengths of a  
30 DWD transport network, between a plurality of input ports and a plurality of output ports comprising:

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wherein each add port is associated with a column of said add  
5 zone and each wavelength arriving on said add port is associated with a  
row of said add zone.

28. A photonic switch as claimed in claim 22, wherein said switch fabric comprises an output matrix with  $K'$  rows and  $I'$  columns of output optical switching elements, wherein each said output port is associated with a column of said output matrix, and each said wavelength is associated with a row of said output matrix.

29. A photonic switch as claimed in claim 22, wherein said switch fabric comprises an output matrix with a switching zone of  $K'$  rows and  $I'$  columns of optical switching elements, and a drop zone of  $M'$  rows and  $N'$  columns of optical switching elements,

wherein each said output port is associated with a column of said switching zone and each said wavelength is associated with a row of said output matrix, and

wherein each drop port is associated with a column of said drop zone and each wavelength arriving on said drop port is associated with a row of said drop zone.

25            30. A photonic switch as claimed in claim 3, wherein said input and  
said output matrices are arranged in two different planes.

31. A photonic switch as claimed in claim 30, wherein said planes are substantially parallel to each-other.

**Figure 3.** The effect of the number of trials on the level of performance.

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32. A photonic switch as claimed in claim 3 wherein said input and output matrices are arranged substantially in the same plane and wherein said switch block further comprises directing means arranged in the path  
5 of the light between said input and output matrices.

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